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CR-129725

EVALUATION OF DIGITAL
CORRECTION OF TECHNIQUES
FOR ERTS IMAGES

Bimonthly Progress Report:
November-December 1972

Contract Number: NAS5-21814

Prepared for:

Goddard Space Flight Center
Greenbelt, Maryland 20771

TRW
SYSTEMS GROUP OF TRW INC.

NASA Contract No. NAS5-21814, Progress Report:
November-December 1972

1.0:   Title: Evaluation of Digital Correction Techniques for ERTS Images
              Principal Investigator Identification Number: P520.

2.0   Progress During Reporting Period

2.1   MSS Software

Receipt of ERTS image tapes during this reporting period permitted the testing of MSS software with ERTS data for the first time. Ground Control Point (GCP) extraction from an ERTS scene was accomplished, and tests of the capability of the software to discriminate against spurious GCP's were initiated. A Kalman filter for precision attitude determination was adapted for the ERTS application and tested against simulated data (during the next reporting period the filter will be utilized in the precision processing of ERTS image tapes).

Annotation tape data also became available during this reporting period and was successfully incorporated into the software. Techniques were tested using annotation tape data for spacecraft attitude and ephemeris calculations.

2.2   Resampling Software

Utilizing outputs from the MSS software or the RBV software, the TRW developed resampling software creates a precision corrected ERTS image. This module incorporates a cubic convolution interpolation technique, as well as bilinear interpolation and nearest neighbor interpolation. All three interpolation methods were tested with simulated data, and tests using ERTS data were initiated.

2.3   RBV Software

No further modifications to the RBV software were made during this reporting period, beyond those described in the preceeding Bimonthly Report.

3.0   Problems

Lack of certain data constitutes the major problem area at this point. For example, annotation tapes have been received for only the Monterey Bay scene, which was added to the list of previously selected sites during this reporting period. No annotation tapes have been received for the other sites. Furthermore, image tapes received for the Monterey Bay scene do not correspond to the annotation tapes received for that scene (necessitating a retrospective product order).

No GCP data was available from NASA during this reporting period for any of the sites. The most recent U.S. Coast and Geodetic Survey maps will be used for selected GCP's to demonstrate TRW's precision image processing techniques.

Other data, so far unavailable, consists of the MSS scan line in length correction algorithm and mirror scan calibration data. The lack of these data will not significantly impede the work performed under this contract, but will impact the quality of the final images produced.

4.0   Significant Results

Using preselected GCP's, no significant difficulty was experienced in GCP extraction. More extensive tests involving scene/scene variabilities were initiated to further explore this area, and to examine the impact of attitude data on precision image processing from GCP inputs.

5.0   Published Articles

None at this time.

6.0 Recommendations

It is recommended that annotation tape data be supplied as nearly in time as the corresponding bulk image tapes. Delays preclude the timely processing of image tapes.

7.0 Changes in Product Orders

Midway in this reporting period, TRW was informed by the Scientific Monitor for this contract that the Monterey Bay scene was being added to the sites previously selected. Shortly thereafter, TRW requested an extension of the coverage period termination data for ERTS products (in a letter to the Technical Monitor for this contract). This became necessary due to delays in receiving requested data, as described in the previous Bimonthly Report.
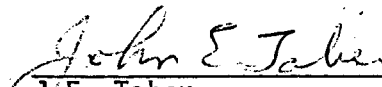
8.0 Changes in Personnel

None

SR:nc

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